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Electron temperature measurements in gasbag plasmas by x-ray spectroscopy*, S. H. Glenzer, C.A. Back, K. G. Estabrook, B. J. MacGowan, D. S. Montgomery, G. F. Stone, J. D. Moody, and R. K. Kirkwood, Lawrence Livermore, National Laboratory, L - 399, P. O. Box 808, Livermore, CA 94551. Large-scalelength gasbag plasmas are currently produced with the Nova laser to study laser-plasma interactions. To diagnose these plasmas we measured the K-shell emission of Ar/Cl dopants and of KBr fibers. In particular, the satellite transitions of the He- α and Ly- α of Ar are detected time-resolved with high spatial and spectral resolution employing slits of 250 μm or 50 μm width and gated microchannelplates. Peak temperatures of 2.8 keV are deduced employing time dependent collisional radiative modeling. The data further show that the gasbag plasmas are homogeneous when using 351 nm heater beams. A comparison with the hydrodynamic code LASNEX shows agreement.

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